

14-#5 (#16) bars evenly spaced drilled and grouted in place at center of slab  $\frac{6}{(150)}$   $\frac{8}{(200)}$ 

# **BASE SLAB JOINT CONFIGURATIONS**

(100)

# **SECTION PARALLEL TO PIPE**

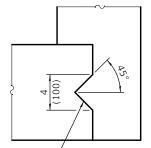
(Without conical top riser)

# SECTION PERPENDICULAR TO PIPE (With conical top riser)

# GEOMETRIC LIMIT



- 1. A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).
- 2. A minimum 9 (230) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
- 3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
- 4. Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
- 5. The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
- 6. Only pipe penetration holes  $\leq$  15 (380) are allowed in riser sections.



Single-element shear key at center of slab

# **SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity

#### **GENERAL NOTES**

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS	
3-1-19	Moved wall reinforcement from	
	inside face to middle.	
1-1-19	Expanded / refined reinforcement	_
·	options. Increased manhole depths.	
		1

11-#4 (#13) bars or

spaced around perimeter.

Optional Joint

Single-element

shear key at

center of slab

equivalent, evenly

Cut bars to fit.

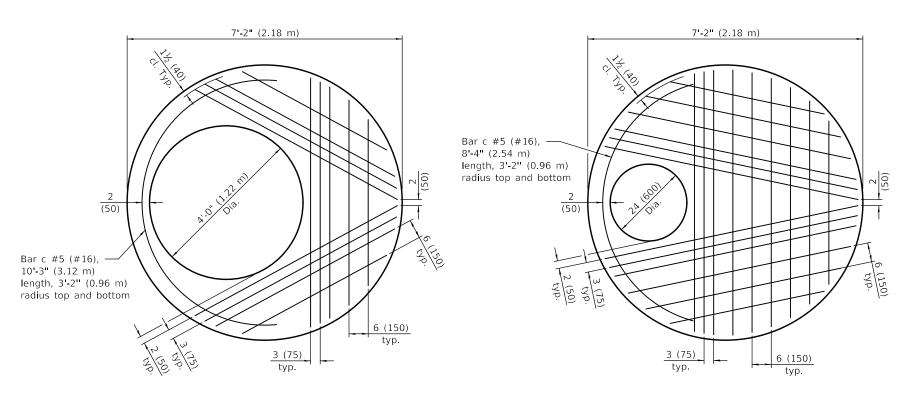
# PRECAST MANHOLE TYPE A 6' (1.83 m) DIAMETER (Sheet 1 of 3)

STANDARD 602406-10

Illinois Department of Transportat	ion :	
PASSED March 1. 2019 ENGINEER OF POLICY AND PROCEDURES	ISSUED	
APPROVED March 1, 2019 ENGINEER OF DESIGN AND ENVIRONMENT	1-1-97	

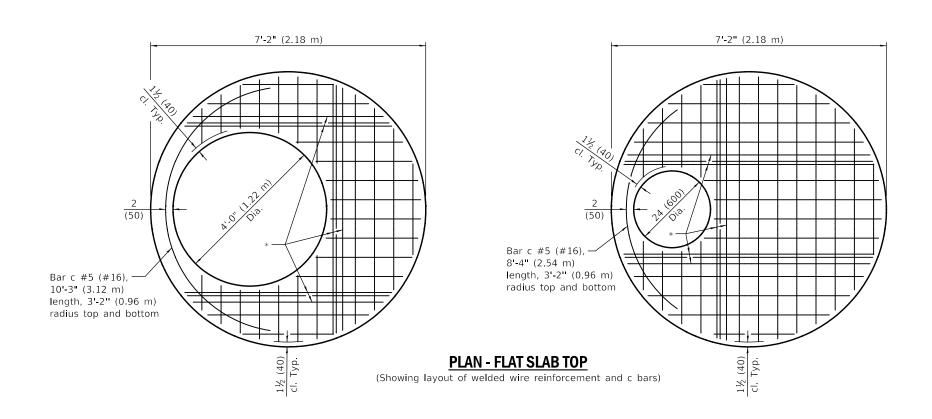
**FLAT SLAB TOP JOINT CONFIGURATIONS** 

(Shown at access hole)



# PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



\* #5 (#16) bars for risers ≤ 10 ft. (3.05 m) tall or #6 (#19) bars for risers > 10 ft. (3.05 m) tall bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

# PRECAST MANHOLE TYPE A 6' (1.83 m) DIAMETER

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STANDARD 602406-10

Illinois Department of Transportation

PASSED

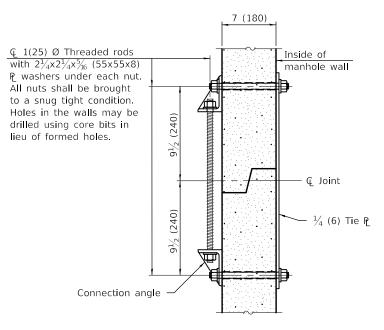
March 1, 2019

ENGINEER OF POLICY AND PROCEDURES

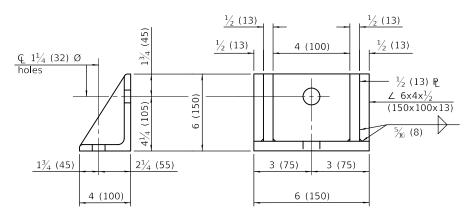
APPROVED

March 1, 2019

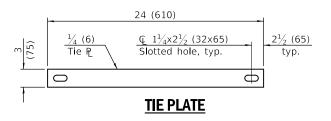
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# **JOINT SPLICE**



# **CONNECTION ANGLE**



# **FLAT SLAB TOP REINFORCEMENT**

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
Location		A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (min.)	Spacing (max.)	Bar Size
Тор	All	0.11 sq. in./ft.	18	0.11 sq. in./ft.	18	#3 or #4
Mat		(233 sq. mm/m)	(450)	(233 sq. mm/m)	(450)	(#10) (#13)
	RH ≤ 10 ft. (3.05 m)	** 0.62 sq. in./ft.	6	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)
Bottom		(1312 sq. mm/m)	(150)			
Mat	RH > 10 ft. (3.05 m)	** 0.88 sq. in./ft.	6			#6 (#19)
		(1863 sq. mm/m)	(150)			

<sup>\*\*</sup> Only one layer of WWR permitted to avoid congestion.

# WALL REINFORCEMENT

Location	Orientation	WWR or Rebar		
Location	Offentation	A <sub>s</sub> (min.)	Spacing (max.)	
4 ft. (1.22 m) Ø Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)	
4 II. (1.22 III) Ø RISEI	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)	
6 ft. (1.83 m) Ø Barrel	Circumferential	0.18 sq. in./ft. (381 sq. mm/m)	6 (150)	
0 it. (1.65 m) Ø Barrei	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)	

# **BASE SLAB REINFORCEMENT**

Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)		
Location		A <sub>s</sub> (min.)	Spacing (max.)	
	RH ≤ 10 ft. (3.05 m)	0.28 sq. in./ft.	6	
Тор	& TH ≤ 20 ft. (6.10 m)	(593 sq. mm/m)	(150)	
Mat	RH > 10  ft.  (3.05  m)	0.40 sq. in./ft.	6	
	or TH > 20 ft. (6.10 m)	(847 sq. mm/m)	(150)	
Bottom	All	0.11 sq. in./ft.	18	
Mat	All	(233 sq. mm/m)	(450)	

PRECAST MANHOLE TYPE A 6' (1.83 m) DIAMETER

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STANDARD 602406-10